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EMBOSSSED IDENTIFICATION (ID) DOCUMENT
SYSTEM

Logistics Management Institute

Prepared for:

Assistant Secretary of Defense (Installations
and Logistics)

August 1972

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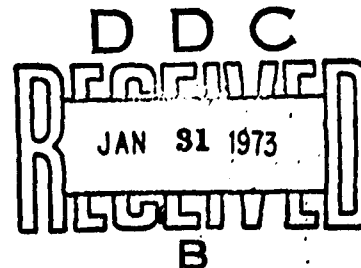
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EMBOSSSED IDENTIFICATION (ID)
DOCUMENT SYSTEM

LMI Task 72--9

August 1972



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| 13. ABSTRACT This study evaluates the costs and potential benefits of providing Armed Forces members and their dependents with embossed ID cards. Included are a description of the present ID card and its production procedures; a survey of various features that can be incorporated in a card to obtain data recording, automated data entry, or data storage capabilities; and a discussion of possible uses of an embossed ID card in hospitals, the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS), military food service programs, and other service activities. Two alternative methods for providing embossed ID cards are presented: one is the addition of an embossing operation to the present decentralized ID card production process; the other is the centralization of embossed ID and production at one or several facilities. The report also discusses the effect the duration of the implementation period has in determining the short range costs of adapting an embossed ID card. | | | |

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SUMMARY

For several years the concept of a single, standard, embossable ID card has been under consideration within the Military Departments. In March, 1971, the Military Departments' Committee for Study of Common Embossed Photo Identification Card recommended that an embossed medical treatment credential be established and prescribed for use DoD-wide. However, the Committee could not agree unanimously on whether the embossed card should be a revision of, or an addition to, the present Uniformed Services Identification and Privilege Card. Consequently, the Assistant Secretary of Defense (Installations and Logistics) requested the Logistics Management Institute to undertake a detailed study of the costs and benefits of an embossed identification card for military personnel and their dependents.

In conducting the study, LMI visited military installations to observe both the present ID card production procedures and the operation of embossed hospital outpatient card systems. We found that the present ID card is adequate for visual identification of the bearer and the privileges to which he is entitled. The cards cost at least 67¢ each to produce, most of which represents labor. We also found no use for the fingerprints on the Armed Forces Identification Card.

Hospital outpatient card systems have demonstrated the value of the self-writing capabilities of an embossed card. Some hospitals serve over a thousand outpatients daily and are required to complete an average of about three medical documents

per patient visit. Hospitals which assure the availability of embossed cards for every outpatient are able to associate up to 95% of the medical documents with the correct patient for follow-up and record filing. In spite of the availability of a service-wide, standardized outpatient medical card, one hospital, which did not provide an embossed card for those outpatients who presented none, was unable to relate about 30% of its outpatient documents to the patient.

The immediate benefit of an embossed ID card would be as a replacement for the medical outpatient cards. Because the ID card is normally presented for verification of entitlement to outpatient care, the self-writing capability of that card would more likely be available than would a separate outpatient card. The embossed ID card would also be useful to the CHAMPUS program to reduce the number of errors in identification data on claim forms. Other benefits of an embossed ID card would be realized after the card is in general use in such places as mess lines, libraries, maintenance shops, and service clubs.

LMI visited commercial firms in the ID and credit card industry. Features were found which could give a card the capabilities of data recording, automated data entry, and data storage. Of those features examined, the only ones evaluated to have potential applicability within DoD were embossing and the magnetic stripe. The costs of equipment to implant and use the magnetic stripe are high, and LMI found no immediate application for that automated data entry feature. However, the use of a magnetic stripe is growing rapidly in the commercial field, and LMI believes appropriate space should be left on a revised format of the military ID card to permit the incorporation of such a stripe at a future date.

There are two approaches to providing an embossed ID card for military personnel and their dependents. One is to add an embossing operation to the present, decentralized production procedures. This would require procurement of \$2¼ million worth of embossing equipment and would bring the individual card cost up to at least 83¢ per card.

The other approach is to centralize the production of ID cards at one, or a few, production facilities. As compared to decentralized production, a centralized system offers more efficient use of equipment, materials, and labor, and greater potential for expanding future capabilities of the card. We believe there are substantial cost savings which would be realized by DoD's adopting that approach to card production. However, available data are insufficient to verify that belief.

The duration of the period over which the embossed card is phased-in is critical to the short-term cost of embossing. If the embossed card were introduced over a three-year phase-in period through initial issue and normal replacement of lost, mutilated, and expired cards, the cost of embossing would be only the incremental cost incurred by adding embossed information to each card issued; that is, 16¢ per card, or one-half million dollars per year (includes the \$2.25 million initial equipment procurement, amortized over ten years).

On the other hand, a purge of the system by rapid introduction of a new card within a few months would incur a one-time reissue cost equal to the full cost of a new card for every card holder in the system. Although a complete reissue may be desirable to avoid the confusion of a dual card system and to eliminate expired and illegal cards from use, IMI believes that

the benefits of a purge would be short-lived and would not warrant the expense associated with a very short implementation period, unless regulations are strengthened concerning the recovery of dependents' invalid ID cards.

As a result of the findings and conclusions of this study, LMI makes the following recommendations:

Recommendation 1: The DoD should adopt an embossed ID card for military personnel and their dependents.

Recommendation 2: The DoD should phase-in the embossed card over a three-year implementation period.

Recommendation 3: The Military Departments should acquire sufficient embossing equipment to permit direct embossing of ID cards at the issuing points.

Recommendation 4: The Military Departments should convert hospital outpatient card systems to use the embossed ID card.

Recommendation 5: The DoD should reduce the size of the ID cards issued military personnel and their dependents to the standard CR-80 size (2 1/8" x 3 3/8" after lamination).

Recommendation 6: The DoD should reformat the DD Form 2 and DD Form 1173 to provide:

a. Space for the following embossed data (* indicates Optical Character Recognition (OCR) font):

1) DD Form 2:

*Social Security Number
*Card Expiration Date
*Date of Birth
Name
Rank

2) DD Form 1173

*Sponsor's Social Security Number

*Card Expiration Date

*Bearer's Date of Birth

Bearer's Name

Bearer's Sex

Relationship of Bearer to Sponsor

Sponsor's Name

Sponsor's Grade

Sponsor's Service

Sponsor's Status

- b. A blank, horizontal, 3/8 inch space on the back of the card for possible future emplacement of a magnetic stripe.

Recommendation 7: The DoD should discontinue the fingerprint entry on the DD Form 2.

TABLE OF CONTENTS

| | <u>Page</u> |
|---|-------------|
| SUMMARY | ii |
| LIST OF TABLES. | ix |
| <u>Chapter</u> | |
| I. INTRODUCTION | 1 |
| A. Background | 1 |
| B. Task Assignment. | 2 |
| C. Scope. | 2 |
| II. THE PRESENT SYSTEM | 4 |
| A. Description and Use of the ID Card | 4 |
| B. Production and Issue Procedures. | 6 |
| C. Equipment, Material, and Labor Costs | 9 |
| D. Other Observations | 13 |
| E. Conclusions. | 13 |
| III. FEATURES WHICH COULD BE ADDED TO THE ID CARD | 15 |
| A. Data Recording (Imprinting). | 15 |
| B. Automated Data Entry | 16 |
| C. Data Storage | 18 |
| D. Specialized. | 19 |
| E. Conclusions. | 19 |
| IV. POTENTIAL BENEFITS OF EMBOSSING THE ID CARD. | 20 |
| A. Medical Cards. | 20 |
| B. CHAMPUS. | 25 |
| C. Food Services Documentation. | 26 |
| D. Other Embossed Card Systems. | 27 |

TABLE OF CONTENTS (Continued)

| <u>Chapter</u> | <u>Page</u> |
|--|-------------|
| E. Recognition of Responsibility | 28 |
| F. Time Savings. | 29 |
| G. New Uses. | 29 |
| H. Conclusions | 29 |
| V. ALTERNATIVES FOR ACHIEVING EMBOSSING. | 31 |
| A. General | 31 |
| B. Decentralized Embossing Systems | 33 |
| C. Centralized Production of Embossed ID Cards. | 36 |
| D. Conclusions | 40 |
| VI. THE DURATION OF THE IMPLEMENTATION PERIOD . . . | 43 |
| A. Discussion. | 43 |
| B. Conclusion. | 45 |

APPENDICES

- A. Copy of LMI Task 72-9
- B. Number of Issuing Points and Embossing
 Machine Requirements

LIST OF TABLES

| <u>Table</u> | | <u>Page</u> |
|--------------|--|-------------|
| 1 | Estimated Number of ID Card Holders | 5 |
| 2 | ID Card Production Costs. | 12 |
| 3 | Embossing Equipment Costs | 33 |
| 4 | Service Estimates of Number of Installations and Embossing Equipment Requirements. | B2 |

I. INTRODUCTION

A. Background

For several years, the concept of a single, standard, embossable ID card has been under consideration within the Military Departments. The Navy's Bureau of Medicine and Surgery proposed the adoption of an embossed identification and privilege card for mechanically imprinting dependents' outpatient medical records as long ago as January, 1964.¹

A recent study conducted by the Military Departments' Committee for Study of Common Embossed Photo Identification Card explored and evaluated the feasibility of embossing certain identification cards used throughout the Department of Defense (DoD). The committee agreed on the applicability and value of issuing embossed ID cards for use by dependents as a medical identification document. The committee, however, could not agree unanimously on whether the embossed ID card should be a revision of or an addition to the present Uniformed Services Identification and Privilege Card (DD Form 1173).²

¹U. S. Department of the Navy, "Adoption of an Embossed Identification and Privilege Card for Mechanically Imprinting Dependents' Outpatient Medical Records," BUMED-44, a project summary and proposal prepared by the Bureau of Medicine and Surgery, Hospital Administration Division (Washington, D. C., January, 1964), p. 3.

²K. C. Drake, N. W. Callow, and W. J. Bates, "Final Report on the Military Departments' Committee for Study of Common Embossed Photo Identification Card," a report to the Assistant Secretary of Defense (Manpower and Reserve Affairs), (Washington, D. C., March, 1971), Tab B, pp. 1-6.

B. Task Assignment

In May, 1971, the Joint Chiefs of Staff requested that a detailed study be undertaken by an independent agency in order to insure that the concept of embossing ID cards would not be implemented on the basis of "a superficial survey or decision."¹ The Logistics Management Institute (LMI) was requested to conduct that study. Accordingly, LMI Task 72-9 was initiated in August, 1971. Appendix A is a copy of the task.

C. Scope

In conducting the study, LMI reviewed ID card production processes in each of the military services as well as in commercial industry. Visits to military ID card issuing facilities were for the purpose of conducting a general survey of present production and issuing procedures. They served to identify some of the potential benefits of a more sophisticated card system. Chapters II and IV of this report discuss the findings of those visits.

LMI also contacted companies in the commercial ID card business and discussed with them the present capabilities, new developments, and current techniques of the ID and credit card industry. We found that most of the requirements of the DoD for an ID card are not peculiar to the military. In fact, many commercial firms are far more sensitive to the susceptibility of the card system to alteration and unauthorized use than is the DoD. Although DoD represents a sizable market for ID card production equipments, its total card requirements are

¹Deputy Director, Joint Staff, Memorandum For the Secretary of Defense, JCSM-237-71, "Embossed Identification Cards for Military Personnel and Their Dependents," 18 May 1971. p. 1.

not as large as those of some states for drivers' licenses. We also observed that the industry is very competitive; that the production of a convenient, attractive, secure card can be accomplished by a variety of techniques; and that there is continuing research on features to improve security and increase the capabilities of a card. Chapter III summarizes some of those features.

Chapter V discusses two alternatives for obtaining embossed ID cards for military personnel and their dependents. One represents a continuation of the present, decentralized production system. The other is a system in which production is centralized to achieve more efficient use of equipment, materials, and labor.

The final chapter, Chapter VI, analyzes the implications of introducing a new card over several months, rather than several years.

II. THE PRESENT SYSTEM

A. Description and Use of the ID Card

The present system provides over 11 million ID cards for members of the armed forces and their dependents (Table 1). Each armed forces member is issued an Armed Forces Identification Card (DD Form 2). His dependents, some civilians accompanying or employed by the Uniformed Services, and some foreign personnel entitled to medical care under the NATO Status of Forces Agreements are issued the Uniform Services Identification and Privilege Card (DD Form 1173). Both cards are printed in security-type ink on a paper insert and laminated between two sheets of plastic. The cards are larger (2½" x 3 3/4") than either of the two standard credit card sizes¹ and display a black and white photograph, signature, and a physical description of the bearer. The DD Form 2 also includes the fingerprints and blood type of the armed forces member. The DD Form 1173 contains data associating the dependent with his sponsoring armed forces member and specifies the eligibility of the bearer to use the theater, commissary, exchange, and medical facilities. Exceptions to listed entitlements are blocked out before the card is issued.

¹There are two standard credit card sizes. The "CR-80" size (2 1/8" x 3 3/8") used by most oil companies, accounts for about 75% of the cards in use. The "CR-50" size (1 3/4 x 3 1/2"), used by Sears Roebuck and some other retailers, accounts for another 20%.

TABLE 1

ESTIMATED NUMBER OF ID CARD HOLDERS

(In Millions)

DD Form 2¹

| | |
|------------------------------|-------|
| Active Duty Personnel | 2.5 |
| Retired Personnel | .9 |
| Reserve Components Personnel | |
| Ready | 2.5 |
| Standby | .7 |
| | <hr/> |
| Total DD Form 2 | 6.6 |

DD Form 1173

| | |
|------------------------------------|-------|
| Dependents of | |
| Active Duty Personnel ² | 3.8 |
| Retired Personnel ³ | .9 |
| | <hr/> |
| Total DD Form 1173 | 4.7 |

| | |
|---------------------------------|------|
| Total Number of ID Card Holders | 11.3 |
|---------------------------------|------|

¹Department of Defense, OASD (Comptroller), Directorate for Information Operations, "Selected Manpower Statistics," 15 April 1972.

²Based on 1.5 dependents per active duty person.
Ibid., p. 43.

³Based on LMI estimate of one dependent per retired military person. No information was available from DoD.

Color coding provides readily recognizable identification of the card bearer's status. All DD Forms 1173 (issued to dependents) are buff. The DD Form 2 is one of three colors: green for active duty members, grey for retired members, and red for members of the Reserve Components (not on extended active duty). In addition, each service has its own version of the DD Form 2. The versions are similar in appearance and identical in color and format, but distinctive emblems identify the individual's branch of service.

The present ID cards are used solely for visual identification of the bearer and his entitlements. The cards must be presented when using a military facility or service. Armed forces members are often required to show their cards when departing or returning from liberty or leave and when receiving pay. Overseas, some foreign governments, as a result of status of forces agreements, accept the Armed Forces Identification Card in lieu of a passport.

B. Production and Issue Procedures

Although the Office of the Secretary of Defense (OSD) has prescribed policy and specified some procedures to standardize the cards, their issue and control are managed by the Military Departments. The cards are made at approximately 900 issuing points.¹ The facilities are located at most military installations, on board ships having crews of over 1,000 personnel, in the offices of the 50 State Adjutants General, and at some American embassies. Production during 1971 ranged from

¹ See Appendix B, "Number of Issuing Points and Embossing Machine Requirements."

half a dozen cards at some of the embassies to over 130,000 at Lackland Air Force Base. Total production for all issuing points is between 3 and 4 million cards annually.¹

LMI visited several ID card issuing points operated by each of the Military Services. The purposes of the visits were to observe procedures and to collect data on the type of equipment used, the number of cards issued, and the number of personnel involved in the task.

The procedures used to produce and issue an ID card are basically the same in all services, but are frequently tailored to suit local needs and capabilities. Typically, the process starts with the preparation of an application at the organization personnel office. The DD Form 1172 is a standardized application for the Uniformed Services Identification and Privilege Card (DD Form 1173). Each of the services has its own application form for its version of the DD Form 2. The primary function of the application is to record the identification data to be transcribed to the ID card and the signature of the approving authority. The completed, approved application is

¹Several factors indicate that total production is between 3 and 4 million cards a year: (1) the Army, Navy, and Air Force Publication Distribution Centers issued a combined total of 3.5 million ID card forms (DD Form 2 and DD Form 1173) during 1971; (2) supervisors at visited ID card issuing points estimated that they supported populations approximately three times as large as their annual production volume; and (3) the "Final Report on the Military Departments' Committee for Study of Common Embossed Photo Identification Card" (Drake, Callow and Bates, loc. cit.) estimated ID card production in the Air Force at about 100,000 per month for a total population of approximately 3.6 million.

presented at the ID card issuing point as proof of the individual's right to a card. Normally, the issuing point, which may be at the base photo lab or security police office, only fabricates the card and must rely on the application for correct identification of the customer's entitlements. After an ID card has been issued, the issuing facility often returns the completed application form to the personnel office for inclusion in the individual's (or sponsor's) personnel record.

At the issuing point, a name board or stencil is prepared and the subject is photographed with the board positioned so that his name and/or social security number appear across his chest in the portrait. Although this is done to make the unauthorized exchange of photographs on a completed card more noticeable, it is also often the only entry of the individual's name on the DD Form 2, other than his signature. If the individual is an armed forces member receiving a DD Form 2, the prints of his two index fingers are recorded on the card. After the identification and entitlement information has been typed and the photograph attached, the card is signed by both the individual and the issuing officer, and laminated. Finally, the issue is completed by the individual's signing for receipt of the card in a card serial number accountability log.

The final step of logging also represents the termination of a chain of events associated with control of the blank ID card forms. As controlled documents, blank DD Forms 2 and DD Forms 1173 are issued by the Government Printing Office to the service publication centers by serial number. Each publication center, intermediate form distribution center, and ID card issuing point must, in turn, account for every serial-numbered form. This accounting involves preparing various transmittal

documents, safekeeping the forms, conducting periodic inventories, and maintaining logs of issued and destroyed forms.

C. Equipment, Material, and Labor Costs

The present card production procedures require only two special items of equipment: a camera and a laminator. Die cutters are also frequently used for sizing and shaping the photograph and the finished card. Most of the Air Force, Navy, and Marine Corps issuing points visited by LMI are using the Avant Quad camera. The Quad is a multiple lens camera capable of taking up to four portraits on a single sheet of Polaroid film. The camera costs about \$500 and can produce a black and white portrait for 7¢. Many of the Army installations are using the Auto-Photo Studio. It is a small booth, similar to those seen at carnivals and airports, which sequentially takes several portraits, processes them in liquid chemicals, and produces finished prints in about two minutes. Although the Auto-Photo Studio costs almost \$4,000, it can produce a portrait for as little as 1¢.

The advantage of the Quad camera, in addition to its lower initial purchase price, is the convenience of using Polaroid film. For small volume, the Quad is also less expensive than the Auto-Photo Studio. However, if the equipment is assumed to have a ten-year lifetime with annual maintenance costs equaling 5% of the purchase price,¹ the Auto-Photo Studio becomes more economical for facilities issuing more than 9,000 cards per year.

¹Equipment manufacturers often offer service contracts for 5% to 10% of the equipment purchase price per year.

Laminators are made by several manufacturers and typically cost about \$500. The plastic film, or laminate, is purchased locally, usually from the vendor of the laminator. The cost of laminate ranges from 3¢ to 12¢ per card, depending on the type, thickness, manufacturer, and quantity purchased.

In addition to equipment and materials, the production of an ID card requires labor, and this is the most difficult aspect of the process to measure in dollars. At almost all facilities, the people who produce ID cards also perform other functions, such as distributing automobile registration tags, making local security passes, or taking passport photos. Often, ID card production is accomplished by the security police, sometimes by the base photo lab, and sometimes by the personnel office. Even when a facility, such as a training center, produces a large volume of ID cards, the workload is cyclical with people shifting from their normal jobs to ID card production during peaks, or, vice versa, from ID cards to typing, housekeeping, or general administrative tasks during lulls.

Furthermore, the amount of effort, in man-minutes of labor per card, varies significantly. A large volume issuing facility, when in full production for a scheduled group of recruits, can produce cards at about three man-minutes each. Other facilities may expend 10-15 man-minutes per card, or even more if the materials and equipment are not handy.

A commonly accepted approach to costing labor in a process such as ID card production is to time the actual steps involved in the process and multiply by an accepted hourly wage rate. Using this technique, a three-man-minute effort computed

at a military man-year cost of \$6,200 per year¹ results in a labor cost of 15¢ per card. This is consistent with the 14¢ average labor cost reported by the Air Force.²

LMI found the 15¢ per card labor cost to be unrealistically low, however, when compared to the actual number of personnel devoted to the card-making task at each issue point. For example, the lowest expenditure for labor was observed at a receiving station where recruits did the fingerprinting, sorting, and assembling of cards. Although the recruits were considered to be zero cost labor, the issuing point still maintained a full-time photographer (16¢ per card), clerks who spent one minute typing each card (5¢ per card), and supervisory personnel who devoted some of their time each day to the card production activities, so that total labor costs at this "least cost" issuing point exceeded 21¢ per card. A more typical operation was observed at another issuing point on the same base. There, two people devoted full time to producing about 12,500 cards per year, making the labor cost close to \$1.00 per card. In fact, other than recruit receiving stations, LMI observed no issuing point that expended less than 60¢ per card in labor and visited one that was spending \$1.74 per card.

Although the visits conducted by LMI constituted neither a complete survey nor a statistically valid sample of ID card production costs, some conclusions can be drawn from our observations. Most recruit receiving stations, which combined

¹The annual composite standard rates for an E-4 enlisted grade in DoD Instruction 7220.25, dated 16 March 1970, with second amendment dated 20 November 1971 are \$6,229 (Army), \$6,205 (Navy), \$6,323 (Air Force), and \$5,725 (Marine Corps).

²Drake, Callow and Bates, loc. cit.

account for about a half million of the over three million cards produced annually, should be able to make an ID card for between 25¢ and 30¢. This is also true for some of the very small volume issuing points for which card production is incidental to their primary function. For those issuing points which must organize specifically for the card production task, but are not able to schedule demand as can receiving stations, the cost per card (including equipment, materials, and labor) is at least 67¢, and the average may approach \$1.00 (see Table 2).

TABLE 2

ID CARD PRODUCTION COSTS

(In Dollars)

| | <u>Minimum Observed</u> | <u>Typical</u> |
|------------------------|-----------------------------|-----------------|
| Equipment ¹ | .01 | .02 |
| Materials | | |
| DD Form | .01 | .01 |
| Film and Processing | .01 | .01-.07 |
| Laminate | .03 | .03-.12 |
| Labor | <u>.21</u> | <u>.60-1.00</u> |
| Total | \$.27 | \$.67-1.22 |

¹Equipment includes procurement (amortized over ten years) and maintenance costs of the following items: camera, laminator, photo die cutter, and corner rounder.

D. Other Observations

The visits to ID card issuing points provided an opportunity to discuss with local managers their suggestions for improving the production or utility of the ID cards. The most frequent recommendation was to eliminate the fingerprint entry on the DD Form 2. The personnel who take the prints are seldom properly trained; the usual result is smudged prints. Even when good prints are recorded on the card, few people are trained to read them. Furthermore, when fingerprints are required for identification, fresh prints are taken directly from the individual rather than from his ID card.

Other recommendations were the reduction of the size of the card so it would fit easily into the credit card pockets of wallets and the use of color-coded entitlement exclusions to provide easily recognized visual signals for administrative personnel at commissaries, theaters, exchanges, and medical facilities.

Several personnel working at ID card issuing points described some of the techniques for fraudulently altering information on the card. The picture, for example, can be changed easily by simply cutting the plastic around the photograph, removing and replacing it, then relaminating the card. Other information, such as the birth date, can be changed the same way.

E. Conclusions

1. The present ID card adequately serves the purpose for which it is intended: namely, visual identification of the bearer and the privileges to which he is entitled.

2. Although the cards can be produced for as little as \$.27 each, they typically cost in excess of \$.67 each, most of which represents labor costs.

3. Fraudulent alteration of the card is not difficult.

4. Fingerprints are not necessary on the ID card.

5. The utility of the card can be improved by reducing its size to conform to one of the standard credit card sizes and by color-coding entitlement exclusions.

Recommendation: The DoD should discontinue the fingerprint entry on the DD Form 2.

Recommendation: The DoD should reduce the size of the ID cards issued military personnel and their dependents to the standard CR-80 size (2-1/8" x 3-3/8" after lamination).

III. FEATURES WHICH COULD BE ADDED TO THE ID CARD

LMI visited commercial concerns in the ID and credit card business. Those visits helped identify a number of features which could be added to the military ID card to enhance its usefulness. Although the present ID card is but a mechanism for identifying and linking a set of entitlements to one individual and preventing others from using that identification, it is also the single common item held by all persons entitled to benefits within the military community. Thus, the incorporation of data recording, automatic data entry, data storage, or other specialized features in the ID card would make those features available for use by all eleven million ID card holders.

A. Data Recording (Imprinting)

Data recording is the ability of the card to substitute for manual transcription of information on the card. "Self-writing" is the term often used to describe this function. In addition to reducing administrative time, using a self-writing card achieves standardization, legibility, and, with special font or style of type, machine readability of the transcribed information.

Data recording capability is achieved by embossing, which is the raising of letters, numbers, or other characters on a metal or plastic plate. Most credit cards have the card owner's name and account number embossed on them. An imprinter

is used to transfer the embossed image to a paper form. If the embossed characters are of a special type, called Optical Character Recognition (OCR) font, the imprinted form can be read by an OCR machine.

Embossing machines employ a punch and die set to raise the characters on the surface of the card. The cost of the equipment ranges from \$700 for a hand-operated machine, capable of embossing 25 cards per hour, to over \$100,000 for a magnetic tape fed, computer controlled machine capable of embossing in excess of 500 cards per hour. The embossing equipment now being used in many military hospitals and service clubs costs \$5,000 and can emboss about 60 cards per hour.

There are two types of imprinters: 1) open head, and 2) closed head. The open head imprinter costs under \$30 and is operated manually by a pumping motion. Because the pressure is not uniform, the impression is usually inadequate for OCR machine reading. The closed head imprinter, however, applies an even pressure across the embossed card and paper form and can produce a machine-readable image. Manually operated, closed head imprinters can be procured for as little as \$40-\$50. Standard commercial imprinters accept either CR-50 or CR-80 size credit cards.

B. Automated Data Entry

Automated data entry, on the other hand, is the direct readability of the card itself by a machine. The volume of information read may be as little as a code character or number, or may include all identification and entitlement information of the bearer. In most cases, however, the machine can identify only the card, not the bearer. It still takes a

human being to verify that the card belongs to the individual presenting it as identification.

There is a variety of features which can be used to achieve automated data entry. The cards can be encoded with a small amount of data in a series of either Hollerith holes (similar to those on computer punch cards) or optically readable markings. Similarly, there are codes made of embossed, parallel lines of varying lengths that can be interpreted by Bar Code readers. Banks use magnetic ink character recognition (MICR) for their check systems; that ink contains a high content of metal particles and can be read magnetically. There are also machines that can directly read the OCR font of an embossed card. But, for the most part, all of the above mentioned features are limited in application, and most new card systems are achieving automated data entry by using a magnetic stripe.

The magnetic stripe looks and functions much like a piece of computer magnetic tape or the tape for a home tape recorder. The stripe runs along the long dimension of the card and can be encoded with 75 to 80 characters of information--almost four times as much as that attainable by other coding features. It can be read quickly and accurately by a suitable reading device. The encoded information need not be permanent; it can be erased and changed without remaking the card. It is feasible to allocate a portion of the stripe to permanent data and the remainder to temporary data peculiar to the local command. And, although the information can be destroyed by a strong, close, magnetic field, it cannot be changed or renewed except by the proper encoding equipment.

The major drawback to the use of the magnetic stripe is the equipment costs. The machine used to adhere the stripe onto the card costs about \$10,000. That process involves a transfer of the metallic compound from a carrier ribbon, under heat and pressure. Although it may be possible to procure rolls of laminate with the magnetic stripe already applied, LMI found no such product yet on the market. The writing (encoding) and reading (decoding) equipment is also expensive; writers cost \$1,500-\$1,800 apiece; readers cost \$600-\$800.

C. Data Storage

Two features suitable for use on ID-size cards to provide a long-term record of data, such as the card owner's complete service record and/or medical record, are microfiche and holograms. A small microfiche dot could be implanted on the card and could contain large amounts of data at a size reduction ratio of 400 to 1. A potential system could result in temporary service record information being kept by a man's duty station, and his microfiche dot being replaced with an updated version when he was transferred. Copies of the revised dot could be forwarded to a central file for permanent records.

The other feature deserves mention because it represents a recent development in technology and may some day revolutionize the ID card industry. It is the hologram. Holography is a technique for photographing with light from a split beam laser. The resulting picture is a mass of black and white spots which can be projected only with a similar laser. Several companies are developing systems which take advantage of the vast data storage capabilities of the hologram, either by implanting a chip on the card or by using hologram data banks against which cards can be verified at time of use. Such

systems can also be made secure by uniquely filtering the laser beams, thus achieving encoded writing and reading capabilities. These techniques have not come into general use but are being exploited by a growing number of organizations within the computer and credit card industries.

D. Specialized

Specialized features are perhaps more appropriately incorporated in local card systems. However, the features are available and bear mention in passing. Such features include notching cards to fit a pre-set lock, embedding magnets to actuate devices such as parking lot gates, and embedding electric circuitry that completes the partial wiring of a door or gate opening device.

E. Conclusions:

1. Embossing of ID cards would permit data recording and automated data entry.
2. A magnetic stripe is the best feature for automated data entry, but making good use of that feature would be expensive. There is no immediate application for a magnetic stripe on the military ID card.

IV. POTENTIAL BENEFITS OF EMBOSSING THE ID CARD

Embossing the military ID card would provide a tool for transferring identification data legibly, completely, and quickly. As a part of the ID card, the embossed feature would always be available to the card owner. Thus, the capability of efficient identification data transfer can be beneficially utilized in a number of applications.

A. Medical Cards

The immediate impact of military servicemen and their dependents having embossed ID cards would be felt in medical installations. LMI visited a number of military hospitals in each service and found all making use of two embossed card systems: an in-patient system and an outpatient system. Inpatient cards were produced for patients upon admission and, although varying somewhat from one hospital to another, seemed to be functioning acceptably.

The outpatient systems were another story, however. All of the hospitals we visited used an embossed outpatient card¹ to some extent. Some hospitals required presentation of the patient's embossed card at the reception desk; when the patient had none, for whatever reason, a card was embossed for him before further processing was begun (except, of course, in time-dependent emergency cases). In order to produce the cards quickly, an

¹ Army and Air Force hospitals use the smaller CR-50 size card, while Navy hospitals were found to use the larger CR-80 size card.

embossing machine was kept near the reception desk, and someone was available to do the work. If ID cards were embossed, they would be available and the hospitals would be relieved of the burden of producing outpatient cards.

Other hospitals were found to be less concerned about the patient having a card prior to further processing, whether because of lack of personnel to do the embossing, lack of a suitable, nearby location for the embossing machine, or lack of interest. One hospital only required the outpatient to fill in an application for a card, which was prepared later and mailed to the patient . . . sometimes after up to two months. In these situations, the availability of an embossed ID card would substantially improve the record maintenance operations of the hospital. Additionally, no time would be wasted filling out applications or waiting for cards to be produced.

The results of having the embossed outpatient cards available were easily seen in the records filing areas. With the changeover to terminal digit filing systems, all records are arranged by the last few digits of the serviceman's or sponsor's social security number. The patient's name alone is of little value, except at those hospitals which attempt to maintain large cross-index files to associate names, old service/serial numbers, dependents' social security numbers, and sponsors' social security numbers. All documents produced as a result of a patient visit are filed in the person's medical record, and the quantities of documents filed daily ran into the thousands in some of the larger hospitals. For example, Darnall Army Hospital at Ft. Hood averaged 1,969 outpatient visits per day in February, 1972, and 1,584 per day throughout 1971. At an average of three documents per visit, the amount of filing is impressive.

Darnall Army Hospital insists on outpatients having embossed cards. As a result, they are required to produce about 100 cards per day for outpatients alone. Still, 300-400 documents per day are unfileable, because the embossed card is not used and the handwritten data are incomplete or illegible. That figure, about 5% of the total daily filing load, is the best LMI witnessed.

At the other extreme, the hospital which made the missing cards after the patients' visits had an unfileable document rate of at least 30%. That statistic means that, at that hospital, almost one out of every three interviews, consultations, blood tests, X-rays, etc., fails to become part of a patient's medical history. The information from a test normally can find its way back to the requesting doctor, and he might be able to identify the patient if an important fact resulted from the test; more likely, however, the significance of the test would be completely wasted. This does not necessarily lead to the conclusion that one-third of all outpatient treatment needs to be repeated--at a significant cost. It does imply, though, that repetition of many tests is required on subsequent visits because no record of the previous tests exists.

In those cases where a serviceman later leaves the service, he may be unable to prove a service-connected disability because a significant document had not been able to be identified by a social security number or legible name. Also, some disabilities may be judged service-connected when, in fact, an unfiled document may have shown the opposite to be true.

The importance of medical records to servicemen, their dependents, and their supporting medical facilities should not be underestimated. The very lives of those individuals sometimes depend on the correctness and completeness of their medical record. Recognizing that importance, hospitals often screen their unfileable documents and fall back on their only method of identifying people by name: they call Washington and make use of the services' locator offices.

Such a process is time-consuming and often unrewarding. It is, therefore, extremely important that the patient's social security number and name appear legibly on every document resulting from his hospital visit. An embossed ID card would ensure that the capability for legible recording goes wherever the bearer goes.

In addition to the savings resulting from the reduction of unnecessarily repeated tests, and the reduction of manpower wasted trying to cross-index social security numbers and names, the use of the embossed ID card would reduce the time spent by trained hospital personnel in manually recording name and associated data on the hospital forms, freeing those personnel to pursue their primary jobs. LMI estimates that 15-20% of all documents, on the average, are unfileable throughout the medical services. These documents are unfileable because the service's embossed medical card is not used and because the patient's social security number is not written legibly. LMI further estimates that at least another 20% of all documents are successfully filed because the social security number is written legibly. In other words, the embossed medical card is used, on the average, only 50-60% of the time. Thus, about half of all medical documents are still handwritten, in spite of the existence of the services' embossed medical cards.

The self-writing feature of an embossed card saves 28-60¹ seconds in recording appropriate identifying data on a medical document. If, for each of those documents currently handwritten, half a minute of a medically trained person's time could be converted from writing data to performing a medical service, a significant amount of such medical service could be gained for the price of embossing ID cards.

As an example, "Statistics of Navy Medicine, Fiscal Year 1971, First Quarter"² yields the following data:

| | |
|---|-------------------|
| Outpatient visits, worldwide, total | 3,892,755 |
| Adjunct Services, all facilities, total (prescriptions, laboratory tests, EKGs, etc.) | <u>11,717,836</u> |
| | 15,610,591 |

If it is assumed that:

1. each outpatient visit and adjunct service generated, on the average, one document requiring the entry of serviceman's or dependent's name and pertinent data,
2. half of those medical documents are now handwritten, and
3. each manual data entry consumed an average of 30 seconds more than mechanical imprinting of the same data from an embossed card,

¹Commanding Officer, Naval Air Station, Miramar, California letter MA serial 695, "Embossed Military and Dependent Identification Cards Test; comments on," of 25 August 1971 to the Chief of Naval Personnel, p. 2.

²U. S. Navy, Bureau of Medicine and Surgery, "Statistics of Medicine, Fiscal Year 1971, First Quarter," Volume 27, Number 1, NAVMED P-5028.

then, approximately 62 million documents per year, or 31 million self-writing operations per year, saving 30 seconds each, would free trained medical personnel a quarter of a million man-hours annually in the Navy alone. If a substantial part of this time could be devoted to better service for armed forces personnel and their dependents, the DoD-wide value of this benefit--and as well, the concomitant reduction of patient waiting time--would outweigh the cost of implementing the embossed ID card system.

B. CHAMPUS¹

Another medical area benefit from embossed ID cards would be to the CHAMPUS administrators, who spend a significant amount of time collecting the data necessary to complete claims forms. Those forms, filled out by hand in doctors' offices, are often incomplete or illegible, so that all required data for the patients are not available.² CHAMPUS personnel, who receive the claims from the civilian doctors for payment, must then try to locate that individual in order to complete the data. The doctors are normally paid first; so, legible, complete identification data from a self-writing ID card would insure the link to the correct patient. A July, 1971, report by the General Accounting Office states:

"An embossed identification card has been proposed for use for beneficiary identification and for use as a means of reducing the number of claims being returned because of incorrect data. The same types of problems currently being experienced regarding

¹ Civilian Health and Medical Program of the Uniformed Services.

² LMI was advised that many civilian doctors and hospitals have im printers and could use an embossed card.

eligibility determinations . . . would continue with embossed cards. Nevertheless, such cards would eliminate many errors by correctly inserting key data on the claim form directly from the embossed card. This would greatly reduce the number of claims returned because of omission or errors in such data, but such advantage might be offset by the increased costs for the cards and related equipment."¹

Further, complete identification data would facilitate CHAMPUS' follow-up regarding eligibility. A master central beneficiary file is being considered to aid in the verification of eligibility for CHAMPUS benefits, so that military families moving from one to another of the fifty CHAMPUS regional districts can be readily assimilated into their new district's administrative processes. Claims forms containing legible, complete data would greatly assist that effort.

C. Food Services Documentation

The subject of control within military messes has long been a point of contention within the services. In general, administrators desire military messes to reduce waste by preparing meals only for the number of people who will be eating. In the past, messes were authorized food ration funds for all the people who were eligible to eat in the mess. Then, a period of time existed during which personnel running the messes kept a tally of their own and received food ration funds for the number of men they reported as having eaten. In 1966, LMI Task 65-30, "Food Ration and Food Service Management," recommended the "use of a 'credit card' or 'charge

¹The Comptroller General of the United States, "Potential for Improvements in the Civilian Health and Medical Program of the Uniformed Services," a Summary Report to the Committee on Appropriations, House of Representatives (Washington, D. C., July, 1971), p. 50.

plate' type of device to record the headcount.¹ The services did introduce signature headcounts in 1968 and early 1969, and the authorization of food ration funds was limited by the number of signatures appearing on the sign-in sheet .

The signature system still exists, but it is believed by auditing groups that control could be further improved by implementing the "charge plate" system. LMI Task 69-5, "Reconnaissance Study--Subsistence Management," described the significant savings attained from the introduction of the signature headcount system and further stated, "While the (signature) system is having good results and is probably the best practical system at the present time, there are plans for improvements."² Those plans involved the use of EDP equipment which was deemed economically infeasible at that time. However, the marriage of embossed ID cards and a device at the head of all mess lines to imprint the mess-user's data on rolls of paper would present an increment of improved control that LMI believes would pay for itself within a short period of time.

D. Other Embossed Card Systems

There exists within the military services a proliferation of embossed card systems for a multitude of uses. No question arises regarding the value of having a self-writing card to

¹Logistics Management Institute, Task 65-30, "Food Ration and Food Service Management," AD479225, (Defense Documentation Center: Washington, D. C., 1966, p. 53.

²Logistics Management Institute, Task 69-5, "Reconnaissance Study--Subsistence Management," (Logistics Management Institute: Washington, D. C., 1969), p. 17. During the course of this study, it was learned that a one-day check of ID cards in the mess line at the Presidio of San Francisco turned up twelve civilians in military clothing attempting to eat free.

accurately, legibly, and completely record identifying data for people who routinely have been required to sign for various items and services. Library cards and mess membership cards are but two examples.

This proliferation of card systems is imposing growing costs to the government. As each new system is installed, expensive embossing equipment must be leased or purchased, and cards for system users must be purchased and embossed. If the ID card were embossed, the local facilities could make use of the embossing feature on the ID card and issue less expensive typed membership or privilege cards when required.

E. Recognition of Responsibility

There are a number of applications of an embossed ID card which would recognize and tend to improve the integrity of the card holder. In these instances, a person's clearly imprinted identification might cause a more careful action on his part than would his scrawled signature. For example, equipment maintenance records may presently include an imprinted identification of the equipment data and the signature of the person doing the maintenance. If the record were expanded to include his own imprinted identifying data, that person might perform the maintenance with a bit more care.¹

Additional applications of the responsibility concept might be in the recording of drug and currency disbursements; expensive purchases; traffic tickets; library, motor pool, and special services checkouts; NCO officers' mess and club charges; and gasoline and self-service supply purchases.

¹ Additionally, as a fringe benefit, better data would thereby become available to assist the analysis of maintenance being performed by various levels of technical capability.

F. Time Savings

Applications will arise in which the self-writing feature of an embossed ID card would be primarily a time-saver. A type of such application occurs where lists of people are produced, such as in security area access and aircraft manifests. Another application occurs where individualized documents are produced, such as mess and berthing passes, security passes, and temporary badges and passes of all types. Also, the production of some personnel records, especially reporting and detachment forms, could have a time-saving application, since the man and his ID card are normally available at those times.

The single, most often cited example of the use of an embossed ID card is as an aid to the check-cashing process. There would be a significant improvement in morale if the self-writing card could reduce or eliminate the waiting lines for check-cashing at commissaries and post exchanges.

G. New Uses

LMI believes that the surface of self-writing applications has been but scratched. New uses would be induced by the availability of the self-writing card. And if an optical character recognition (OCR) font, or style of type is used, an automatic means of data entry for many new applications would additionally occur. Each application increases legibility and accuracy of data recording and returns man-hours for the performance of primary duties.

H. Conclusions:

1. The primary benefit of an embossed military ID card would be as replacement for embossed medical out-patient cards.

2. Other uses would be likely to prove worthwhile after an embossed ID card is introduced.

V. ALTERNATIVES FOR ACHIEVING EMBOSSING

A. General

There are two basic approaches to producing photo ID cards. One, such as that presently used in the DoD, decentralizes production to the issuing points. That is, each issuing point has the equipment required to completely manufacture a card. Several commercial ID card systems are based on this same approach. Polaroid and Avant, the two largest companies offering this type system, use specially designed, dual-lens cameras to simultaneously photograph the subject and portions of the application card. Thus, the card itself is a composite photograph; there is no need to paste a separate photograph of the subject onto a card form. Although a DoD conversion to either the Polaroid or Avant system would reduce the labor effort at the issuing points and provide a card which is less susceptible to fraudulent change, such conversion would also require replacement of existing photographic equipment. Furthermore, the Polaroid or Avant system presents no real advantage over the present system insofar as embossing is concerned. The procedures and costs of providing an embossing capability in a decentralized system would be the same for the Polaroid, Avant, or present ID card system. Section B discusses the advantages and costs of adding an embossing operation to the present decentralized production system.

The other approach to producing a photo ID card is to concentrate card production at one or a few facilities. Once production is centralized, the cost of adding any new feature to a card, be it embossing, magnetic stripe, or hologram chip, would be only a few cents per card. Section C describes a centralized system and discusses some of its advantages and disadvantages.

If embossed information is added to the ID card, regardless of the technique or system used, some reformatting of the present DD Form 2 and DD Form 1173 would be desirable to consolidate all embossed information into several lines and to standardize its location on the cards. This will insure that imprinted information common to both cards appears in the same order and area on imprinted forms. The "Final Report of the Military Departments' Committee for Study of Common Embossed Photo Identification Card" includes a list of items of information that the Committee recommended be embossed.¹ LMI concurs with that recommendation with the exception that only numbers should be in machine readable font, so that embossing machines need only have one style of type for numerals and one style of type for other characters.

The size of the ID card, if embossed, should also be reduced to the standard CR-80 credit card size, so that it will fit commercial imprinters. Although it only costs a couple of dollars to change the guide in an imprinter, it is an inconvenience which can be avoided by producing an industry standard size card.

¹ Drake, Callow, and Bates, loc. cit.

B. Decentralized Embossing System

Approximate investment costs for the equipment required by the 900 issuing points to produce embossed cards are shown in Table 3.

TABLE 3

EMBOSSING EQUIPMENT COSTS

| | | | |
|------------------|--|---------------|--------------------|
| 300 ¹ | High Volume Machines | @ \$ 4,000 ea | = \$1,200,000 |
| 300 | Medium Volume Machines | @ 2,500 ea | = 750,000 |
| 300 | Low Volume Machines | @ 1,000 ea | = <u>300,000</u> |
| | Equipment Procurement Cost | | \$2,250,000 |
| | Maintenance over 10-year lifetime ² | | <u>\$1,125,000</u> |
| | Total Lifetime Equipment Cost | | \$3,375,000 |
| | Cost Per Year | | \$ 337,500 |
| | Cost Per Card ³ | | \$.11 |

The \$2,250,000 figure does not make allowance for possible use of some of the embossing equipment now operated by hospitals, service clubs, libraries, and other base facilities. The availability of such equipment depends upon the degree to which an

¹See Appendix B, "Number of Issuing Points and Embossing Machine Requirements."

²Equipment manufacturers often offer service contracts for 5% to 10% of the purchase price per year.

³Estimated production of three million cards per year.

embossed ID card either would replace existing local cards or could be produced on the same equipment. Nor does the figure include the cost of imprinters, because most hospitals, which initially would be the primary users of an embossed ID card, already have them and there is no reasonable way to estimate the number of other facilities that ultimately would find use for an embossed card.

In addition to each card's share of the equipment procurement and lifetime maintenance costs (about \$.11; see Table 3), each card requires one to two minutes labor for the embossing operation. However, because the embossed information would probably replace, rather than supplement or duplicate, some of the data currently typed on the ID card, the total increase in labor effort probably would not exceed one minute (\$.05 per card). Thus, the incremental cost of adding embossing would be about \$.16 per card. This means that the annual cost to DoD, over and above the cost of the present ID card system, would be about half a million dollars. (That cost includes the \$2.25 million equipment procurement cost, amortized over ten years.)

There are several options for marrying the embossed information to the ID card. The most direct would be to emboss the plastic ID card itself. The embossing would be accomplished at the issuing point as the final step in the present production process. The operation would require the purchase of embossing equipment for every ID card issuing point. In addition, because embossing is the final step, any embossing errors would require a complete remake of the ID card. This method retains all the advantages of decentralized production but would take a little longer to produce each card. It also

improves the card's resistance to fraudulent changes of the information or photograph because the card cannot be relaminated without destroying the embossing.

The only technical problem in producing the directly embossed card is the suitability of various laminates to embossing. Some plastics will not retain embossing, especially when put in a wallet and sat on all day. Other types must be some minimum thickness to retain the embossing through repeated use. Because the laminate used on the present card is often purchased locally, the type of plastic varies from one issue to another. Should the direct embossing method be accepted, some issuing points will have to convert to embossable laminate, and this might entail a new laminator (\$500) to provide higher operating temperature and pressure.

An alternative to direct embossing is to emboss either a plastic pouch, into which the card is later inserted, or a separate plastic strip which is adhered to the card. In either case, the effect is the attachment of pre-embossed information to a complete ID card. The advantage of such an approach is that the embossing need not be accomplished at the same time or location as issue of the basic card. This means that every issue point does not necessarily need embossing equipment; the embossing can be performed at large installations and the pouch or strip mailed to the issuing point. It also means that embossing errors would not require remake of the ID card, so facilities other than the card issuing point could add the pouch or strip to cards as needed, rather than emboss every card in the system. The material costs for the pouches or strips would be offset by the savings from fewer remakes of ID cards due to embossing errors. Some cost reduction could be attained by centralizing the embossing operation, thus reducing equipment costs and, probably, labor expenses.

The primary drawback of the embossed pouch or strip approach is esthetic: the pouch looks like a package, and the strip looks like a piece of plastic stuck on the card. In addition, neither the pouch nor strip adds any security to the card. They can be removed or changed without tampering with the identification portion of the card.

C. Centralized Production of Embossed ID Cards

LMI observed the system used by the State of Minnesota for production, control, and issue of the state driver's license. It is a centralized production system. The card produced is a full-color, embossed plastic, photo ID card of the CR-80 size. All cards are made at one facility in St. Paul and mailed to licensees. At the time of LMI's visit, the system had been in operation only about three months, and the current production time of 30 days was expected to drop to 7-10 days as administrative procedures improve.

Production of the card starts when an application is completed at one of the 100 licensing stations located throughout the state. At each station, a specially designed camera, which uses bulk loaded 35 mm color film cartridges, simultaneously photographs the applicant and specified portions of the application card, including the applicant's signature and a card identification number. Periodically, depending on the volume of the station, the cartridge of exposed film is mailed to a central processing laboratory. Concurrently, the corresponding applications are forwarded to an administration office, which transcribes data from the application to central computer files. The application information is automatically validated

by comparison with existing files and edited to establish the applicant's proper licensing category. A computer print-out and magnetic tape listing of applicant information are then sent to the processing laboratory.

The processing laboratory develops the exposed film and contact prints the ID card. All color coding and header information is applied during the contact photo printing process. The finished photo, which includes an image of the applicant, his signature, and all official state categorization and authentication information, is then laminated between two sheets of plastic. The cards are sequenced to agree with the order of the magnetic tape listing and embossed by a tape fed embossing machine.

The processing laboratory at St. Paul produces about 5,000 cards a day (about a third of its capacity) and requires a staff of eight. There are an additional 8-10 people employed at the administration office and one at each licensing station. The State pays 43 cents per card to a service company which provides all equipment and materials, including cameras and film, and operates and maintains the processing laboratory. In addition, the state bears the cost of taking the photograph and transcribing application data to existing computer files, but, because these operations are integrated with tasks unrelated to card production, their cost, and hence the total card cost, is unknown.

A centralized production system, such as that used in Minnesota, offers many advantages over the present decentralized system used to produce ID cards for military personnel and their dependents. The centralized system can make very efficient use

of equipment and materials, since all production is accomplished on a large volume, assembly line basis. Labor costs can be held to a minimum both by simplifying procedures at the issue point and by using labor saving machinery at the central laboratory. There is no need for controlled documents, such as the present DD Form 2 or DD Form 1173. Cards can be photo-produced in several different colors, formats, or designs to indicate the categorization of the bearer; no variation in equipment or procedures is required at the issue point. The quality of the cards can be better controlled at one or several production centers than at many, and production techniques can take advantage of the best equipment, materials, and procedures developed by industry. Similarly, a centralized system inherently improves security during the production process. Other than the approved application, the only items requiring close control are the transparencies used for photo-copying logos onto the cards. None of the other materials or stages of production are sensitive to compromise; the film bears nothing but the individual's photograph and signature, and the completed card is resistant enough to tampering that it is of no value to anyone but the intended bearer.

The primary disadvantage of centralized production is the inconvenience to the customer of having to wait 10 to 14 days for his ID card. In most cases, it would be desirable to provide a temporary identification document, possibly a tear-off portion of the application, until receipt of the permanent card. In some situations, such as at embarkation points or overseas, a more substantial, though not embossed, temporary card would be required.¹

¹The NATO Status of Forces Agreement requires that an ID card when serving as a passport, must contain: (1) photograph, (2) signature, (3) name, (4) rank, (5) service number, (6) branch of service, and (7) date of birth.

The adoption of a centralized system would represent a major change in present production procedures. Regardless of the ultimate benefits of such a change, initially it would involve much more planning, coordination, administration, and supervision than would be required to simply modify the present system. In addition, there is no guarantee that a centralized system would be administered effectively enough to gain all the advantages of such a system. For example, in Minnesota the contractor has been successful in providing a 72-hour turn-around time for the card production process, but the state has been unable to provide the adjunct administrative support necessary to achieve less than 30-day service to the licensee.

The total costs of a centralized system are also difficult to establish. The experience in developing and operating centralized photo ID card systems is concentrated in the three commercial companies. The only cost estimates LMI could obtain were the contract costs of services provided by those companies. The commercial companies, however, do not provide all services involved in production and issue of the cards. As is the case with the Minnesota drivers' licenses, the contractor usually only makes the card, sometimes providing photographic equipment as well; the government must provide the labor and supervision for administering the card system. Based on conversations with representatives of credit card companies, LMI believes that DoD could contract for full-color, embossed plastic ID cards for less than 60¢ each, but the total cost of the card, including labor at the issuing points, is unknown. In Section A of this chapter, it was estimated that an embossed ID card, produced in the present, decentralized system, would cost at least 83¢

per card: that is, at least 67¢ for the present unembossed card plus 16¢ for the embossing. Because a centralized system would require much less labor effort at the issuing point than the present system, LMI believes that the total cost to produce and issue an ID card in a centralized system would not exceed 83¢ per card. We cannot assure, however, that the adoption of a centralized system would actually result in substantial dollar savings for the DoD.¹

D. Conclusions

1. The incremental costs of adding embossing to the present decentralized production process would be about 16¢ per card, or a half million dollars per year for DoD. This cost includes \$2.25 million for initial equipment procurement, amortized over ten years. Costs of this magnitude are justified by the potential benefits of an embossed military ID card (see Chapter IV).

2. Direct embossing is the best method of adding embossed information in the present decentralized production system.

3. Compared to decentralized production, centralized production potentially offers:

- a. More efficient use of equipment, materials, and labor.
- b. Greater potential for expanding future capabilities of the ID card.

¹The DoD could establish a government operated production facility, but there is no reason to believe that the total card cost would be less than if cards were produced under contract.

4. Available data are insufficient to attribute substantial cost savings to the adoption of a centralized production system by DoD.

Recommendation: The DoD should adopt an embossed ID card for military personnel and their dependents.

Recommendation: The Military Departments should acquire sufficient embossing equipment to permit direct embossing of ID cards at the issuing points.

Recommendation: The Military Departments should convert hospital outpatient card systems to use the embossed ID card.

Recommendation: The DoD should reformat the DD Form 2 and DD Form 1173 to provide:

a. Space for the following embossed data (* indicates Optical Character Recognition (OCR) font):

1) DD Form 2:

- *Social Security Number
- *Card Expiration Date
- *Date of Birth
- Name
- Rank

2) DD Form 1173

- *Sponsor's Social Security Number
- *Card Expiration Date
- *Bearer's Date of Birth
- Bearer's Name
- Bearer's Sex
- Relationship of Bearer to Sponsor
- Sponsor's Name
- Sponsor's Grade
- Sponsor's Service
- Sponsor's Status

- b. A blank, horizontal, $\frac{3}{8}$ inch space on the back of the card for possible future emplacement of a magnetic stripe.

VI. THE DURATION OF THE IMPLEMENTATION PERIOD

A. Discussion

The duration of the period over which the embossed card is introduced is critical to the short-term cost of embossing. If the embossed card were introduced over a three-year phase-in period through initial issue and normal replacement of lost, mutilated, or expired cards, the cost of embossing would be only the incremental cost incurred by adding embossed information to each card issued; that is, \$.16 per card, or a half-million dollars a year (includes equipment procurement cost amortized over ten years). Of course, during those three years there would be two different, valid cards in the system. As long as the two are substantially the same in appearance there should be few problems. But any major changes in color, size and format could create confusion, not only with the military, but also among civil and foreign authorities who recognize the military ID card as an official identification document.

On the other hand, a purge of the system by rapid introduction of a new card within a few months would incur a one-time reissue cost equal to the full cost of a new card for every card holder in the system. With over 11 million card holders, this one-time reissue would be expensive for any type card. Even if the lowest labor and material costs now experienced (see Table 2) were assumed to apply to all production, the cost of a one-time reissue would be nearly five million dollars.¹ More realistically, a complete reissue would

¹This computation is based on \$.43 per card: \$.27 for the present unembossed card plus \$.16 for the embossing.

probably cost over nine million dollars,¹ and that figure includes neither the unknown cost of the production time lost by service members and their dependents who are being reissued ID cards, nor the potential costs for lease of some equipment to handle the short-term increase in embossing requirements during the phase-in period.

Nonetheless, a complete reissue may be desirable to avoid the confusion of a dual card system. It also would eliminate, for a time, expired and illegal cards from use. In time, however, the quantity of expired and illegal cards in existence would undoubtedly begin to build up again.

LMI has not been able to determine the extent of the unauthorized card problem. Unauthorized cards in existence today usually are dependents' cards which were not collected and destroyed when the service member sponsor was released from active duty. Enlisted personnel's dependents' cards carry an expiration date, which is the date of the serviceman's Expiration of Obligated Service. Officers' dependents' cards, however, expire six years from issue, due to the indefinite nature of the length of many officers' service. Thus, an officer's dependent's card which was not destroyed when his service terminated could appear valid for up to six years after cessation of entitlements.

It appears that any real benefit that might arise from a system purge would have its primary impact in the CHAMPUS area. There, unauthorized card use normally results in full payment

¹This computation is based on \$.83 per card: \$.67 for the present unembossed card plus \$.16 for the embossing.

to the civilian doctor and then reliance on the applicable military service to prosecute for or waive recovery of the paid fees. Historically, the services usually waive recovery. Thus, the unauthorized use of an ID card in a CHAMPUS application normally results in a real cost to the government.

Beyond those areas wherein actual costs to the government are incurred, little real damage to the government appears to result from the unauthorized ID cards. The card holder may be able to purchase items at lower prices in a PX/PX or in a commissary, but all purchases help the military store; the injured party is the commercial concern which lost the business. The government's loss is limited to the resultant reduction of taxes paid by the commercial concern.

LMI believes that the benefits resulting from purging the system of unauthorized cards by simultaneous reissue of all cards would not warrant the expense associated with a very short implementation period, especially since that type of purge would produce a short-lived benefit.

B. Conclusion:

The short-lived benefits of a complete purge of the ID card system do not justify the estimated \$9,000,000 reissue cost.

Recommendation: The DoD should phase-in the embossed card over a three-year implementation period.

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46
Appendix A
Page 1

ASSISTANT SECRETARY OF DEFENSE
Washington, D. C.

Installations and Logistics

DATE: 17 August 1971

TASK ORDER SD-271-165
(Task 72-9)

1. Pursuant to Articles I and III of Department of Defense Contract No. SD-271 with the Logistics Management Institute, the Institute is requested to undertake the following task:

A. TITLE: Embossed Identification (ID) Document System

B. SCOPE OF WORK: The study is to be an in-depth analysis and evaluation of the concept of a pocket-size, embossable ID card, among other purposes, suitable for use throughout the military departments as a data source document. In addition to exploring possible applications and distinctive features for such an ID card/system, the study report will draw conclusions as to its overall long-range potential and cost-effectiveness.

2. SCHEDULE: An interim report of tentative findings and suggestions will be made to the Assistant Secretary of Defense (Manpower and Reserve Affairs) in January 1972. A final report will be made by 31 July 1972.

/s/ Glenn V. Gibson

ACCEPTED: /s/ William F. Finan

DATE: 18 August 1971

NUMBER OF ISSUING POINTS AND EMBOSSING
MACHINE REQUIREMENTS

The exact number of facilities issuing the present DD Form 2 and DD Form 1173 is not known and is not readily available. The cards are issued at most, but not all, military installations. They are issued also on board some large ships, at some military attaché offices in American embassies, and by the State Adjutants General.

Nor is it known with certainty how much embossing equipment would be procured if DoD adopted an ID card suitable for embossing at the issuing point. Some issuing points would make use of equipment already being used locally for embossing cards at hospitals, service clubs, libraries, and other base activities. Some small issuing points might not obtain any embossing capability at all. Others would require more than one machine, either for large production volume or as back-up equipment.

Studies by the Military Departments Committee¹ and the Navy Bureau of Medicine and Surgery² help derive estimates for the number of card issuing points and their requirements for embossing machines (Table 4). These estimates are further supported by DoD lists³ identifying 820 military installations;

¹Drake, Callow and Bates, loc. cit.

²U. S. Department of the Navy, loc. cit.

³DoD provided lists of "Selected Military Installations or Activities Outside the United States," and "Principal Military Installations or Activities in the 50 States," dated July, 1971.

TABLE 4

SERVICE ESTIMATES OF NUMBER OF
INSTALLATIONS AND EMBOSSING EQUIPMENT
REQUIREMENTS

| | <u>Army</u> | <u>Air Force</u> | <u>Navy and Marine Corps</u> | <u>DoD Total</u> |
|-------------------------|-------------|------------------|------------------------------|------------------|
| Number of Installations | 244 | 362 | 440 | 1,046 |
| Embossing Equipment | | | | |
| High Volume | 100 | 75 | 3 | 178 |
| Medium Volume | 150 | 180 | | 330 |
| Low Volume | <u>100</u> | <u>107</u> | <u>150</u> | <u>357</u> |
| Total | 350 | 362 | 153 | 865 |

when added to the 50 issuing points maintained by the State Adjutants General and approximately 25 issuing points on ships, the total is 895 possible issuing points.

Because there is so much uncertainty about the number of issuing points and their embossing equipment requirements, and because it would require a thorough survey by the Military Departments to obtain the data, LMI used the following assumptions throughout the study:

ASSUMPTIONS

1. There are 900 ID card issuing points in DoD.
2. If DoD were to adopt an ID card suitable for embossing at the issuing point:
 - a. Each issuing point would procure one embossing machine.
 - b. One third of the embossing machines procured would be for high volume production, one third would be for medium volume, and one third would be for low volume.

Although these assumptions are a simplification of the situation, they provide an adequate basis for making the decisions pertinent to this study.